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BLOOD STREAM INFECTIONS IN UROLOGICAL CASES*

FRANCIS G. HARRISON, M. D.**

Philadelphia, Pa.

The presence of microorganisms in the blood stream is probably a far commoner condition than is often suspected. There is clinical and experimental evidence that in the majority of cases the bacteria are destroyed in the blood stream without giving rise to a clinical entity. Experimentally this has been shown by Wysokowitch in 1882. In 1909 Libman & Celler¹ showed that in sinus thrombosis, the circulating bacteria disappear from the blood within a few hours after the offending sinus has been excluded from the circulation. Shottmuller² observed the enormous numbers of bacteria which enter the blood stream at the time of curettage in these cases (as demonstrated by blood cultures made simultaneously with curettage), all disappear within a few minutes or at the most an hour or two. Where the organisms are not destroyed, we have the condition known as bacteremia, and with absorption and resultant symptoms, that grave complication—septicemia. Bacteremia, as stated by Keefer, Ingelfinger and Spink³, may be considered to be the result of a loss of equilibrium between the normal clearing mechanism of the blood and the rapid overflow of bacteria from one or more foci of infection.

While septicemia may occur from extraurinary sources such as the infections in the skin, teeth, and intestines, and have a metastatic lesion in the urological tract, the majority of cases of blood stream infection in urological cases, arise from within and often

follow urethral instrumentation and operation.

There have been in the past many differences of opinion in regard to the explanations of severe reactions which occasionally follow instrumental or operative manipulations of the genito-urinary tract.

"Dittel believed that in fatal cases, death was due to acute nephritis.

"Clark believed that fatalities resulted from a marked functional disturbance of the kidneys in addition to the development of organic lesions in those organs.

"Weir attributed the cause of urethral fever to a reflex nervous influence, poisoning of the wound and system due to changed condition of the urine and ascending extension of inflammation to the kidneys.

"DaCosta and Sir Henry Thompson believed that the reaction was due to a profound reflex nervous disturbance.

"Clade in 1887 found a spore-forming bacillus in three cases of urethral fever—twice through splenic puncture and once after death from the spleen and liver.

"Halle in a rapidly fatal case, found a short ovoid form in the urine and blood and renal abscesses.

"Moullin in 1898 expressed the opinion that the reactions were due to virulent bacilli or their toxic products in the blood stream.

"Bertelsmann and Maw in 1902 described three cases of urethral fever in which positive blood cultures were found and they expressed the belief that the bacteria entered the blood stream from traumatized areas in the urethra.

"Hammond in 1909 concluded that the chief factor in a true urethral fever is a disturbance of the thermogenic centers through the vesical centers.

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** From the Urologic Service of the Presbyterian and Graduate Hospitals, Philadelphia.

"Greenberg in 1911 expressed the belief that there were two different types of reaction, the urethral chill which was of nervous origin, and the urethral fever which was due to sepsis.

"Crabtree in 1916 reported seven cases having positive blood cultures after urethral catheterization, and in addition, four instances of positive blood cultures in pyelonephritis." Quoted from Scott⁶.

Brand, Dunlop & Dick⁴ in investigating a large series of renal infections, found the colon bacillus a very frequent invader and thought they were blood borne from the large intestine. Nesbit⁵ in the study of renal infections, regards the staphylococcal type as relatively common and almost universally of hematogenous origin. Scott⁶ reported 82 cases of blood stream infection from the Brady Institute, of which 77% were bacillary in type and 23% were coecal. In 80% of cases, the urethra was the portal of entry. Hyman & Edelman⁷ regard blood stream invasion as not uncommon. They describe two types, a bacteremia which is generally transitory and with a lower mortality, and a septicemia which is grave, with high mortality. In their series, the majority of infections followed urethral instrumentation or operation. Of 64 cases, 45 were bacillary and with a mortality of 20%, while 19 were coecal with mortality of 68%.

In this series, infections such as typhoid fever, tuberculosis, undulant fever and gonococcal have not been included. It would seem that patients with urological conditions requiring operations, are similar to those with pathology in the upper respiratory tract where septicemia is not uncommon following operation. It is essential that the diagnosis be made early and Scott⁶ in his study at the Brady Urological Institute, had sterile trays prepared so that any patient having a chill or a rise in temperature to 102° or above, could have culture immediately. The chills, fever, sweats and prostration present a classical picture of septicemia, but the diagnosis must be made by blood culture. This should be repeated on successive days. Even in diseases with obvious blood stream metastases, the bacteremia is often intermittent; it occurs

in "showers" as Walton Martin⁸ well says. Whether one makes the blood culture at the right or wrong moment is a happenstance. This is the reason that blood cultures, if at first negative, must always be repeated. Only those with a positive blood culture or positive necropsy findings are reported in this series. When there is suspicion of blood stream infection, it is better to employ some form of chemotherapy at the same time blood is drawn for culture and we usually inject either metaphen or pregl's iodine for sterilization of the blood until something more specific is indicated.

In this series of 29 cases of septicemia with the urinary tract as a primary focus or metastatic site, the bacteriological report showed:

INFECTING ORGANISMS

Staphylococcus Aureus	9 cases
Streptococcus Viridans	6 "
Hemolytic Streptococcus	3 "
Hemolytic Staphylococcus Aureus ...	4 "
B. Coli	4 "
Staphylococcus Albus	2 "
Friedlander's Bacillus	1 "

29 cases

with some cases showing mixed infection.

TREATMENT

With the diagnosis established, the treatment may be considered under the following procedures.

- 1). Prophylactic
- 2). Adequate surgical drainage—
 - (a) Extra-urinary
 - (b) Urinary—(1) Cystotomy
(2) Nephrostomy
- 3). Blood Transfusions—small amount—
50-250 cc.—
repeated with convalescent cases
with immunized blood.
- 4). Serum—
 - (a) Anti-streptococcic
 - (b) Anti-staphylococcic
 - (c) Antigonococcic
 - (d) Bacteriophage

Realizing from long, bitter experience that the urethra, prostatic bed and bladder infection ascending to the kidneys, are potentially portals for blood stream infection, we have endeavored to follow and stress upon students the importance of preventative therapy. In all instrumentation of the urinary tract, the keystone of success is patience, perseverance and copious amounts of sweet oil, and to that should be added rigid aseptic technique.

URINARY FOCI

- 1). Urethra
 - (a) Urethral Fever-instrumentation
 - (b) Permanent Catheter
 - (c) Infection—Gc.
- 2). Bladder and Prostatic Bed
 - (a) Infected prostate
 - (b) Infected bladder—(1) Stone
 - (2) Tumor
 - (3) Diverticulum
- 3). Kidney
 - (a) Hydronephrosis
 - (b) Ptosis and Infection
 - (c) Calculus
 - (d) Acute Pyelonephritis
 - (e) Cortical Abscess

EXTRA-URINARY CAUSES:

- 1). Carbuncle and Skin Infection
- 2). Throat Infection
- 3). Teeth
- 4). Appendix
- 5). Pulmonary Tuberculosis.

The prompt recognition of any urinary foci with adequate surgical drainage if possible, is the first and most important step for recovery. If the urethra be the portal, then cystotomy will give anatomic and physiologic rest—and minimize the absorption. It is necessary to recognize the fact that a retention catheter for drainage purposes is badly tolerated by certain individuals, and to resort to suprapubic drainage in such cases before it is too late. When the focus is the prostatic bed after operation, it is difficult to obtain drainage and the patient's chances are thereby lessened. If there be ascending infection to kidney with pyelonephritis on one side—as happened to several in our series, nephrostomy or nephrectomy is indicated.

Where the urinary tract is a metastatic site, with suppurative nephritis, cortical abscess and perinephritic abscess, prompt surgical measures are required for drainage.

When the metastatic abscesses occur, these must be drained, and such cases often have a better prognosis.

BLOOD TRANSFUSIONS

Blood transfusion employing 50-250 cc. amounts and repeated every 1-3 days, preferably whole blood using different donors, is recognized as one of the most valuable agents in the treatment of septicemia. According to Stetson⁹, whole blood has several advantages because it overcomes secondary anemia and builds up the general condition of the patient and it has a definite bactericidal ac-

tion upon the offending organism. Immunized donors are especially acceptable for blood transfusions. Hooker¹⁰ suggests that every patient with staphylococcal septicemia be given an early transfusion of suitable blood and later with immune blood. A direct blood transfusion is recommended since citrated blood is thought to be less bactericidal than whole blood. Stetson⁹, Hooker¹⁰ and McCleave¹¹ and others have reported very acceptable results in the treatment of these cases with whole and immune blood. In the streptococcal and staphylococcal septicemia, serum, such as anti-streptococcal and anti-staphylococcal, is advised and should be used early. Kolmer¹² advocates the wider use of serum for prophylactic purposes. There are also convalescent serums available. In the gonococcal cases, anti-gonococcal serum seems to be more effective than serum in some of the other types. Bacteriophage—as prepared for us—gave no result whatever.

Immunologists believe it is not unreasonable to suppose that recovery from hemolytic streptococcal infection with bacteremia depends on the development of an effective local and general defense mechanism and that this depends in large part on a high grade of immunity and on the location of the infection.

CHEMOTHERAPY

- 1). Mercurochrome
- 2). Gentian Violet
- 3). Flavine Compounds
- 4). Metaphen
- 5). Pregl's Iodine
- 6.) Sulfanilamide
- 7). Formalin
- 8). Oxoate
- 9). Methenamin—Salihexin—Uritone
- 10). Arsphenamine
- 11). Neoarsphenamine
- 12). Mandelic Acid
- 13). Pyridium

It is evident from the number of agents recommended that there is no one, "a shot" of which will cure the patient. We can sterilize the blood stream, but if the primary focus has not been stamped out, it is expecting too much to hope that something given intra-

venously will not only sterilize the blood but the focus as well and not injure the host. Ottenberg¹³ and others claim that the large list of bacterical drugs lose nearly all of their effectiveness when mixed with blood, despite what is claimed for them in vitro.

From the above list are some that are no longer used and we have attempted in recent years to employ that particular agent that is indicated by the identification of the infecting organism. We advocate injection of metaphen, as recommended by Raiziss & Severae¹⁴, or Pregl's iodine until something more specific may be indicated. Neither one produces any reaction and they are well tolerated by the patient. We have abandoned gentian violet and mercurochrome, as advocated by Young & Hill¹⁵. In a recent article, mercurochrome has been employed again, by Emmett¹⁶, who states that not more than 10 cc. of 1% solution is an excellent antipyretic in cases of protracted acute pyelonephritis. Formalin and oxoate intravenously have fallen into the discard and Oxoate is now recommended only by mouth, intravenous being too toxic.

Sulfanilamide and its associated derivatives are at present favored, particularly in the streptococccic types. Given at first intravenously and orally, it is now advised by oral administration as the absorption and the therapeutic effects are as good and the untoward effects on the blood cells are alleged not to occur. When given, the beneficial effects occur rapidly—within forty-eight hours—so that if no improvement is noted within that time, it is doubtful to rely upon this alone. Undeniably Sulfanilamide is useful and represents a distinct advance in chemotherapy. There are, however, certain toxic substances in the drug, which will probably be eliminated.

Methenamin in some form such as salixhexin and uritone, may be given intravenously and has the added property of attempting to sterilize the urine. We advocate this when there is infection in the urine, there being no ideal urinary antiseptic as yet. Mandelic acid is recommended in cases of *B. coli*, and the arsphenamines in the coccal infection of

the kidney, as is pyridium. Adair¹⁷ et al. have recently shown that pyridium has no consistent germicidal power.

AGE

Age is a prime factor of grave prognostic importance in septicemia as brought out by Rosenow¹⁸ in the review of cases from the Mayo Clinic:

	<i>Streptococcus</i>			<i>Staphylococcus</i>			Mortality
Age	Patients	Died	Mortality	Patients	Died	Mortality	Mortality
Under 25	14	6	43%	10	5	50%	50%
25-50	25	17	68%	7	3	43%	
50 and over	22	20	91%	12	11	92%	

In our series of cases, the age ranges from 21 to 87 and shows that over 50 years, the mortality rapidly increases:

Age	Cases	Cured
50 yrs. or less	5	3
51 to 60, incl.	5	2
61 to 70, incl.	10	2
71 to 80, incl.	5	1
81 to 87, incl.	3	0

RELATION OF DRAINAGE—RECOVERY

Name	Site	Organism	Drainage
Aldrich	Bladder	Strep. Virid.	Cystotomy
Gordon	Bladder	Strep. Virid.	Nephrostomy & Nephrectomy
Stockdale	Carbuncle-neck to kidney	Staph. Aureus	I & D of Perinephritic Abscess
Smith	Urethra	Strep. & Staph.	Drained skin abscesses; irrigated urethra
Endriss	Bladder	Staph. Aureus	Drained sternal abscess; irrigated bladder
Hime	Pyonephrosis	B. Coli	Nephrectomy
Mielke	Pyelonephritis	Staph. Albus	Lavage of kidney pelvis
Scoville	Ureter	Staph. Aureus	Removal of Calculus

CHEMOTHERAPEUTIC RESULTS

1. Pregl's Iodine	16 cases	5 cures
2. Transfusions	13 "	3 "
3. Metaphen	4 "	2 "
4. Methenamine	7 "	1 "
5. Sulfanilamide	4 "	1 "
6. Mandelic Acid	1 "	died
7. Uritone	1 "	cured

MAYO THERAPEUTIC RESULTS

Treatment	<i>Streptococcus</i> Cases	<i>Streptococcus</i> Deaths	<i>Staphylococcus</i> Cases	<i>Staphylococcus</i> Deaths
No treatment	11	11	6	2
Transfusions	18	9	4	1
Transfusions & Dyes	4	3	7	4
Transfusions & Serums	17	13	2	1
Transfusions, Serums &				
Dyes	3	1	1	1
Serums & Dyes	1	1	2	0
Serums	4	4	1	1
Dyes	1	1	3	3

MORTALITY STATISTICS

Average	<i>Streptococcus</i> & <i>Staphylococcus</i>	60-80%
Mayo	Urological cases—7 <i>Streptococcus</i>	85%
	6 <i>Staphylococcus</i>	83%
Our Series	144 cases—all kinds—combined	69%
	Urological cases—29—combined	73.3%

SUMMARY AND CONCLUSIONS

A series of 29 urological cases with septicemia is reported.

Prophylaxis in urethral manipulation is advocated to prevent a portal of entry, for when developing, septicemia has a mortality of 60-80%.

Prompt diagnosis by blood culture and the adequate drainage of any focus, offered the only hope of recovery in this series.

Repeated small blood transfusions are indicated.

Chemotherapy plays an important role in the sterilization of the blood but is of little use where the urinary focus cannot be eliminated.

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1900 Spruce Street

DISCUSSION

DR. BRICE S. VALLETT (Wilmington): No sadder page is recorded in the physician's diary than that dealing with the bloodstream invasions. Out of a clear sky the ambulatory patient is stricken and too often our supreme therapeutic efforts fail.

It is not enough today to examine the urine for albumin, sugar, blood cells and casts. The sediment from freshly voided, or, better still, freshly catheterized urine should be stained for bacteria. It has been definitely shown that positive evidence of bloodstream inva-

sion may be found before positive blood culture. Very often, too, these findings show different organisms than those grown from urinary culture; therefore both procedures are indicated. Where multiple infectious foci exist, we must decide which is the primary one, remembering that secondary foci such as kidney and prostate now move in line as primary foci. After removal of the original primary focus these then become the primary focus, and as Dr. Harrison pointed out, the posterior urethra is a very common, possibly the most common, portal of entry.

McKenzie of Montreal has traced the lymphatic spread of infection from the prostate to the upper urinary tract, and Mr. Winsbury White of London has traced this lymphatic spread from the endocervix to the upper urinary tract in the female. Undoubtedly the use of alcohol and contraceptives has a grave bearing in this matter. The impression gained in the last year or two of practice has been that nonspecific prostatitis has far outdistanced the specific type, and is quite commonly found in the course of routine examination.

In our enthusiasm for the newer drugs, particularly sulfanilamide, let us not forget some of the old standbys, i. e., intravenous mercurochrome and neoarsphenamine. In a well advanced infection where sulfanilamide is being used as Dr. Harrison showed us here on the slide, particularly mercurochrome, it may so depress the temperature that abscess formation may be overlooked. However, the leucocyte count and possibly the sedimentation rate is usually unaffected.

Obstructions in the urinary tract, unless of an emergency nature, had best be attacked only after attempts at urinary antisepsis and simple drainage. Despite obstruction, Helmholtz sterilized the urinary tracts of children by using the ketogenic diet at the Mayo Clinic.

This urinary antisepsis precedes and follows all instrumental manipulation and operative intervention in the urinary tract. The surgeon must not open up vulnerable tissue spaces, and very often the operation should be in two stages to keep the virulent infection confined.

The matter of prostatic massage is an important one, both from a diagnostic and therapeutic standpoint. The patient should be relaxed and therefore it is best to put him on his back on the table. The initial massage should consist in little more than gentle palpation of the prostatic contour. It is not important to obtain secretion at this sitting. No matter how you try sometimes you will be unable to get secretion. Only after the patient will tolerate the examining finger without pain may firmer pressure be applied. Vigorous massage is never justified. The danger here of blood invasion is very great—and also to the eye.

McKenzie and Geng state: "Infection, whatever its source, within the genito-urinary tract or outside of it, is a complication of the most serious consequence. The influence of infection, even if mild, upon the cardiovascular and respiratory systems in the presence of genito-urinary disease is so grave as to constitute the 'balance of power' between life and death."

I want to thank Dr. Harrison for his very comprehensive and thorough study.

DR. N. R. WASHBURN (Milford): The hour is getting rather late, and so I will limit my remarks. We certainly enjoyed Dr. Harrison's paper, and it has been enlightening to a great number of us, I am sure.

We are all familiar with urethral chill following instrumentation. I think it is only recently that physicians have been aware of what is taking place, or what follows a urethral chill, that oftentimes it means the beginning of a very serious complication, a bacteremia or a septicemia. The exact cause, of course, of these infections, just how they enter the bloodstream, is not a special problem but one tied up with all medicine, and especially surgery. In urinary cases it is due to an upset, possibly temporary, of the hydrostatic balance between the excretory systems, the kidney and bladder and the bloodstream, due probably to a reflex inhibition, and with a resultant reversal of the flow of lymph and excretory products, with the absorption of bacteria, those especially in the temporary cases of urethral chill.

The question of handling the cases was very

adequately and very well discussed, that is, of treating them gently and removing the focus whenever possible. That is, the first thing to do is not to do too much. If there is obstruction or infection, gently remove the obstruction and whenever possible, without serious operative procedures, get drainage because probably adequate drainage is the most helpful thing that can be done toward the recovery of the patient.

MITRAL STENOSIS OF RHEUMATIC ORIGIN

Usual and Unusual Features

VICTOR A. DIGILIO, M. D.*

JOSEPH A. PESCATORE, M. D.

Philadelphia, Pa.

Mitral stenosis is rarely a pure lesion in the sense that it exists without organic or functional insufficiency. While not infrequently one is tempted to hazard such an opinion, previous experience in the pathological laboratory has demonstrated the wisdom of applying a broader label to these cases. Therefore mitral stenosis is employed herein in those cases which lacked clinical evidence of mitral insufficiency, yet with the full knowledge that the latter may nevertheless be associated.

Much material regarding this lesion has accumulated in the literature. Its clinical recognition is therefore facilitated. However, occasionally one stumbles across a case which has passed through several very capable hands without discovery. In order to avoid these errors it seems necessary from time to time to review our experience.

The analysis of this small group of cases is presented mainly because it represents a more or less cross-sectional view of this interesting valvular lesion with some uncommon features deserving emphasis. The group comprises thirty-four cases of mitral stenosis with or without clinical evidence of insufficiency, varying in age from 13 to 64 years. Twelve were males and twenty-two females. Four males (13, 23, 35 and 39 years of age, respectively) and two females (13 and 42 years of age) have died. Five came to autop-

* From the Dept. of Medicine, Temple University Hospital and Medical School.

sy. The following criteria were considered in labeling a case mitral stenosis: (1) diastolic rumbling murmur at the apex; (2) diastolic thrill; (3) normal cardiac area of percussion dullness; (4) accentuated second pulmonic; (5) rheumatic history; (6) left auricular enlargement, and prominence of the pulmonic conus fluoroscopically; (7) right axis deviation and abnormal P waves (high voltage, significant notching and widening) in the electrocardiogram; (8) auricular fibrillation without systolic apical murmur.

Mitral stenosis and insufficiency were diagnosed on the basis of the above in addition to the following: (1) systolic murmur at the apex; (2) percussible cardiac enlargement; (3) auricular fibrillation with systolic murmur at the apex; (4) left ventricular enlargement fluoroscopically; (5) the above electrocardiographic findings regardless of axis deviation, if any. Additional murmurs, if any, were recorded and interpreted if possible.

These criteria divided the cases as follows:

(1) Mitral stenosis—Four males; one had in addition, mild congenital pulmonary stenosis (discovered at autopsy), aortic stenosis and chronic glomerulonephritis with hypertension. Two others were treated for bleeding peptic ulcers and the mitral deformity was an incidental finding. In one of the latter the diastolic apical murmur could not be elicited for several days following a copious intestinal hemorrhage.

Six were females. One, when first seen at 11 years of age, had a faint systolic, untransmitted apical murmur. She was not seen until two years later when a loud rumbling diastolic apical murmur was heard. She died of a pulmonary embolism at the age of 13 and autopsy revealed a button-hole mitral valve and a chronic fibroid pulmonary process thought to be due to active rheumatic infection. Another had hyperthyroidism controlled by x-ray therapy. There was activation of her rheumatic process during this period with subsidence following the control of her thyroid state. Incidentally, the latter is not an infrequent observation in rheumatics with hyperthyroidism.

(2) Mitral stenosis and insufficiency. Eight were males. One (age 26 years), had a systolic aortic murmur transmitted up the vessels of the neck and no other signs suggestive of aortic stenosis. The murmur was attributed to scarring of the aortic valve due to a previous rheumatic aortic valvulitis. Another male (age 13 years) had in addition a pancarditis with severe attacks of angina pectoris and autopsy demonstrated marked coronary sclerosis. Another (age 23 years) had also a tricuspid stenosis with late insufficiency verified at autopsy.

Sixteen were females. One girl of 15 years had in addition an aortic insufficiency during an acute rheumatic phase with marked cardiac failure. She became and remained moribund despite all efforts. Finally on the third day all hope was abandoned and therapy, consisting of salicylates, digitalis, diuretics and oxygen, was discontinued. She made a miraculous recovery and has been well for eight months to date. Another girl of 13 years had congenital lues apparently controlled. One young woman of 22 years had a systolic murmur over the aortic region thought to be due to scarring of a previous valvulitis.

The histories of the cases of the entire series were interesting. Eighteen cases had had one or several of the major manifestations of rheumatism (rheumatic fever with or without arthritis, chorea major with or without other rheumatic manifestations and tonsilitis). One patient reported six yearly attacks of arthritis. Another was said to be in excellent health until his twenty-fifth year when he had his initial and only attack of rheumatic arthritis incapacitating him for 6 to 9 months; he died at the age of 39 years. Autopsy showed a mitral and aortic stenosis. Fourteen had had one or several of the manifestations of low grade active rheumatic disease (recurring sore throats, abdominal pain, muscle and joint aches, growing pains and nose bleeds). Two of these patients reported pain in the upper left abdominal quadrant only on locomotion for from two or three years during their early teens. There were two cases whose histories were completely

negative for symptoms suggestive of rheumatic disturbance.

Symptoms of cardiac congestive failure were recorded in fifteen cases, 6 males and 9 females. Hemoptysis exclusive of cardiac failure or pulmonary embolization was reported in four cases (26, 29, 22 and 51 years of age respectively). Hypertension was found in three cases. One male (39 years of age) had a blood pressure varying from 250/115 to 190/90; a chronic glomerulonephritis complicated the picture. The boy of 13 years with severe attacks of angina pectoris had a blood pressure of 160/40 due to functional aortic insufficiency since autopsy failed to reveal aortic valve disease. A young girl with aortic insufficiency had a blood pressure of 158/0.

The mitral stenosis group showed blood pressure readings varying from 100/60 to 130/80; most of them below 115/70. The group of mitral stenosis and insufficiency showed slightly higher blood pressures varying from 100/70 to 140/95; most of them above 125/75.

Other physical findings grouped themselves as follows: an apical thrust was noted in approximately 50% of the cases of both groups. A diastolic thrill was elicited in eleven cases and in three of these it was necessary to have the patient exercise and lie on the left side before the thrill could be palpated. Cardiac percussion dullness was increased in twenty-four cases (all of the group of mitral stenosis and insufficiency). A snappy first sound at the apex was heard in five patients of the mitral stenosis group. The pulmonary sound was accentuated in thirty-two; the aortic sound was accentuated in one and the second sound was split in two cases. Seventeen cases had permanent auricular fibrillation with an average age of onset (as nearly as it can be computed) of 32 years; the youngest of 15 and the oldest of 54 years. Two others had transitory auricular fibrillation; a girl of 15 years had this arrhythmia for almost one week during an acute phase, and a woman of 46 years who develops attacks of asthma and auricular fibrillation or flutter lasting from a few hours to several days whenever she has a respiratory infec-

tion. Disappearance of the diastolic apical murmur in both of the latter instances was observed with the onset of auricular fibrillation. A diastolic rumbling apical murmur was heard in eighteen cases (one was a case of auricular fibrillation). In several the adventitious sound could be elicited only with the patient lying on the left side and in one case only after exercise. One patient was interesting in that at the time he was first seen when he had been referred because of hemoptysis (pulmonary tuberculosis had been ruled out by x-ray and other examination). Nothing could be found on examination except an accentuated pulmonary sound but fluoroscopy showed left auricular enlargement, some prominence of the pulmonic conus, and the electrocardiogram revealed abnormal P waves. The diagnosis of mitral stenosis was made and for about eighteen months this case was presented as a case of so-called silent mitral stenosis when finally a diastolic rumbling apical murmur appeared. Another patient, a physician 35 years of age, who gave a history of three attacks of rheumatic arthritis was the most interesting of the entire series. He was unaware of a cardiac lesion and many physical examinations were apparently negative. Auscultation in all positions and after exercise revealed a snappy first sound and an accentuated pulmonary sound. However, when he was made to exercise while the bell of the stethoscope was held over the apical region, a definite rumbling diastolic murmur was heard which disappeared practically simultaneously with the cessation of exertion. Slight left auricular enlargement and moderate prominence of the pulmonic conus were observed fluoroscopically and there was right axis deviation. Sound tracings taken with the patient in the upright, recumbent and left lateral positions were normal. When taken immediately at the cessation of effort significant waves were seen in the diastolic period for about five cardiac cycles. Another interesting case is that of a young woman, 25 years of age, in her fourth month of pregnancy. She gave a definite history of rheumatic disease in childhood but no auscultatory findings had been reported prior to three months before her arrival for exami-

nation. Her heart was normal in size, the first sound was normal in character, a rumbling diastolic murmur was distinctly audible only when the patient was placed in the recumbent position and only over a small area measuring about 2 cm. in diameter at the left sternal border, at the level of the fifth interspace. There was moderate left auricular enlargement and the pulmonic conus was prominent. There was right axis deviation and the P wave in lead 11 were of high voltage and notched. In view of these findings and in the absence of contradictory data the diagnosis of mitral stenosis due to rheumatic infection in the past was made.

Evidence of congestive cardiac failure was observed in fifteen patients, six males and nine females. Left sided failure preponderated in two cases; a male of 52 years following accidental and surgical trauma, and a woman of 26 years with evidence of low grade active rheumatic disease. Right sided heart failure was observed in five cases one of which a 23-year-old male with mitral and tricuspid lesions had had three attacks of acute right sided failure within sixteen months. Autopsy confirmed the findings. Of the remaining eight cases in which there was generalized failure without preponderance of any one side, two died. In all except one case failure was of relatively recent origin. One young woman of 32 years with auricular fibrillation had her initial and only attack of failure during an active rheumatic phase in her twenty-seventh year. She has been free of the manifestations of cardiac failure for five years to date. An additional case, a boy of 13 years of age died of coronary failure without congestive manifestations.

An attempt to ascertain the cause of cardiac failure in these cases showed that:

- (1) An active rheumatic phase was a factor in seven cases.
- (2) Hypertension due to chronic glomerulonephritis was a factor in one case.
- (3) Unusual heavy lifting apparently was a factor in two cases.
- (4) Pregnancy was a factor in two cases.

No definite cause could be found in the remaining cases.

Seven patients had a total of seventeen pregnancies, normal and of full term. In one case there were two normal pregnancies, one miscarriage and one premature birth. Following the latter there resulted a reactivation of the rheumatic process lasting three years during which left sided failure occurred. One patient developed signs of failure during her first pregnancy, was carried safely through it but was advised against future pregnancies. One patient had had seven children, two of which were twins, by the time she was thirty-five years of age. She has never been in cardiac failure. The remaining four patients of this group experienced no difficulty from one to three pregnancies.

Embolic phenomena were observed in eight of the thirty-four cases. Two were non-fibrillators; a girl of thirteen years with pulmonary embolism and death, and a woman of forty-two years with cerebral embolism who survived with evidences of a hemiplegia. Six others were fibrillators; two had pulmonary, two had cerebral and two had hepatic embolization.

Analysis of fluoroscopic examinations in this group led to the following conclusions:

Left auricular enlargement occurred in all except two cases. This chamber in the latter cases would be considered at the upper limits of normal in size by some and slightly enlarged by other observers.

Cases of the mitral stenosis group usually presented hearts of normal size with prominent pulmonary arcs and left auricular enlargement unless the patient had had cardiac failure. Left ventricular enlargement was unusual unless there existed failure, active infection or pregnancy. With regard to the latter, it is the impression of the authors that material cardiac enlargement during pregnancy is to be viewed with suspicion of active infection or approaching cardiac failure.

In the group of mitral stenosis with insufficiency there is left ventricular enlargement in addition to the above. In this series only one case demonstrated also right auricu-

lar enlargement accounted for by a tricuspid stenosis.

The pulmonary vessels are usually more prominent in well established stenosis. The impression gathered from this study is that this is more so in mitral stenosis with failure, and mitral stenosis complicated with insufficiency, with or without cardiac failure.

The analysis of the electrocardiograms of these cases agreed with the known facts. For the sake of brevity only the conclusions will be reported: 1) right axis deviation was more common in the mitral stenosis groups; 2) left axis deviation was slightly more common in the mitral stenosis and insufficiency group; 3) notching of the P waves was slightly more common in the latter group; 4) there was a tendency toward higher voltage of the P waves in the mitral stenosis group; 5) the width of the P waves was less than 0.1 seconds in all cases of mitral stenosis while in 50% of the cases of mitral stenosis and insufficiency the P wave was wider than the upper limits of normal; 6) P wave changes were most evident in lead 11 in the mitral stenosis group and in leads 1 and 11 of the mitral stenosis with insufficiency group. The P wave changes observed lead one to infer that there was a greater tendency to auricular strain in the group of mitral stenosis with insufficiency.

SUMMARY AND CONCLUSIONS

A clinical study of thirty-four cases of mitral stenosis is described and the results noted. The most constant sign is the characteristic apical murmur. While recognition of the lesion in the average case is simple, there are occasions when an unduly accentuated pulmonary sound, snapping first sound at the apex, and strong apical impulse should arouse the curiosity of the observer in a case where a murmur is apparently lacking, particularly if a history of past rheumatic disease is obtained. Since the knowledge of the presence of mitral stenosis is important because of the possibility of arrhythmias (paroxysmal auricular tachycardia, auricular extrasystoles, auricular flutter and auricular fibrillation), embolic phenomena, hemoptysis and cardiac failure, further studies are in-

dicated in questionable cases. The demonstration of left auricular enlargement fluoroscopically is strong evidence for mitral stenosis especially in the absence of heart failure. The electrocardiogram may present evidence of auricular strain.

THE COMMON FORMS OF HEART DISEASE IN RELATION TO SURGERY

FREDERICK HNAT, M. D.*

Elizabeth, N. J.

It is my desire to stress the more important features of the common forms of heart disease in their relation to surgical risks without attempting to cover what may be termed the petty details. It is hoped that this endeavor will serve as an aid in making surgery not only safe for the heart but also the heart safe for surgery.

Today an important chapter in the history is in the making, spreading from the larger medical centers to the smaller and finally to the single surgeon wherever he may be. It involves the careful clinical history and examination which we call the study of the patient so that he may be safely prepared for surgery. The mass of medical knowledge has become so complicated, the contacts with sciences allied to medicine so frequent and intimate as to make this study today much more difficult than it used to be for the individual physician. In other words, the practice of medicine has ceased to be a one man job. For these reasons it is evident that those surgical clinics with internists and laboratories seem to have unusually low mortality rates. In the mutual interest of the patient and the surgeon this cooperation should be more regularly practiced in order to solve the cardiac problems of surgery.

On the other hand, there is no doubt that the demands of modern surgical practice require not only the close cooperation of the internist and the laboratory consultant but also the background of a rounded medical experience for the surgeon himself. Today, it is of utmost importance for the surgeon to view heart disease in the light of the newer

* Assistant Attending Physician, Elizabeth General Hospital.

concepts. In recent years, in the heart clinics all over the country, order has been brought out of apparent chaos by the use of a system of nomenclature as suggested by the New York Heart Association.¹ According to this scheme of classification, the surgical risk is viewed from the standpoint of a well standardized measurement of the functional capacity of the heart. By this yardstick, patients with organic heart disease are divided into four groups, as follow:

- I. Patients with organic heart disease, "able to carry on ordinary physical activity without discomfort."
- II. Patients with organic heart disease, "unable" to carry on ordinary physical activity without discomfort.
 - A. Activity slightly limited.
 - B. Activity greatly limited.
- III. Patients with organic heart disease and with symptoms or signs of heart disease when at rest, unable to carry on any physical activity without discomfort.

The most important point as regards the cardiac patient as a surgical risk is to determine the condition of the myocardium, and in this to ascertain how the heart carries its load, especially any extra load. By and large, the careful detailed subjective story of the patient's response to effort will afford a better index of the myocardial reserve than any other known objective examination, and most patients have been carrying on tests of this in their daily lives. This opinion is held in spite of the growing weight of the electrocardiogram and other instrumental methods used in diagnosis and prognosis. On the other hand, the place of the electrocardiogram may occasionally be primary, but usually it serves as the corroborator of clinical observations whose future offers much promise. At present few clinicians would make the decision of the surgical risk on this basis alone except in the cases of unusual errors of conduction. When this clinical study has been satisfactorily carried out, it is then the duty of the clinician to put the heart in the best possible

position to carry the extra load of an operation, and the duty of the anesthetist and the surgeon to make this load as light as possible.

In order to provide a more satisfying picture of the heart in its relation to surgery, it seems fitting here to discuss the common forms of heart disease from the etiological aspect. We may say that most forms of organic heart disease are due to rheumatic fever, arteriosclerosis (coronary artery disease), hypertension, and syphilis. Thyroid disease is not an infrequent cause.

THE RHEUMATIC TYPE

Rheumatic fever is the most potent of all agents which endanger the health of the heart. The heart condition resulting from it arises when these young victims should be economic assets rather than liabilities.

The nature of rheumatic heart disease may be active (carditis) or inactive. When it is active, all surgery is contraindicated, except for imperative reasons. This, of course, also applies to children with active rheumatic fever, for we are never positive of the extent of myocardial damage. Yet I believe that the frequent estimation of the sedimentation rate of the red blood cells is of the greatest value as an index of the activity of the infection in rheumatic heart disease as well as of any other manifestation of acute rheumatic fever, provided it is considered in conjunction with other signs of activity. This non-specific test is the most delicate of all and may serve as a valuable aid in deciding on the optimum time for surgical intervention. Active rheumatic heart disease (rheumatic carditis), in the absence of gross failure, is usually associated with a high sedimentation rate.

When the rheumatic infection is found to be inactive by satisfactory clinical study, the surgical risk of the patients with this type of heart disease with normal cardiac mechanism and without a history of congestive failure is only slightly increased over normal.

Auricular fibrillation is frequent in patients with rheumatic heart disease and its presence adds an additional load to the burden of an already damaged heart, and also of course, to the surgical risk. However,

with controlled digitalis therapy, this arrhythmia adds little to the danger.

Congestive heart failure is also a frequent complication of rheumatic heart disease. The history or presence of congestive failure greatly increases the operative risk but since there are other causative agents of heart disease with failure, this condition will be discussed later under an appropriate heading.

THE ARTERIOSCLEROTIC TYPE

In this type of heart disease the incidence of arteriosclerosis elsewhere in the body is relatively low. In this group are those patients past fifty years with heart disease not apparently due to hypertension or any other etiological agent. Here we have to deal with kidneys of different grades of efficiency, as well as some degree of myocardial degeneration. What is really important in arteriosclerotic cases is the condition of the myocardium, for over two-thirds of the surgical deaths due to cardiac failure are in patients considerably over 50 years. Such patients should be subjected to a complete cardiovascular study, which should include whenever possible vital capacity determinations, electrocardiography, roentgenography and orthodiaphygraphy. Even the slightest evidence of cardiac disease should not be overlooked in this study.

The consensus of opinion is that in general the operative risk increases with age in the arteriosclerotic type. Also, it may be mentioned that the surgical danger increases roughly in proportion to the rise in blood pressure above the average. Furthermore, this risk is still increased with the use of general anesthetics which may cause a marked fall in blood pressure.

Such disturbances of cardiac rhythm as pulsus alternans, bundle-branch block and auriculo-ventricular block do occur in arteriosclerotic patients and would advise us against all but inevitable surgical procedures. In a few instances of these disturbances in youthful hearts the patients have survived surgical procedures. Paroxysmal auricular fibrillation is not infrequent and it usually stops, but if it continues through operation and af-

terward, small doses of digitalis should be used to control the condition, for the heart becomes too slow and inefficient on larger doses of this drug.

CORONARY DISEASE

One of the greatest responsibilities a clinician has to discharge is in making a differential diagnosis between upper abdominal disease and coronary disease. It is very unfortunate that these two conditions often present such similar clinical pictures. It is not the classic case of coronary thrombosis that offers the diagnostic difficulty, but it is the increasing incidence of atypical cases that is being encountered. For the recognition of an acute attack of coronary disease, a comprehensive clinical study is required.

The electrocardiograph is occasionally a means of elucidation of this problem, and in many institutions electrocardiographic study is a prerequisite for major surgery on all middle aged and elderly patients. But it must be remembered that electrocardiographic and clinical evidence should always be weighed together in reaching a final decision, as coronary disease and abdominal disease may coexist in the same patient.

Patients with acute coronary disease are poor operative risks and surgery should not be undertaken except in extreme emergencies. However, necessary surgery may be performed about three months following acute coronary occlusion when the patient is ambulatory and the infarction has apparently completely healed.

Post-operative coronary thrombosis is one of the complications which cardiac patients, especially the later age (arteriosclerotic) group, may develop. This extremely dangerous complication dispels any optimistic view regarding recovery, and demands the most painstaking care. Recently a study by Master, Dack and Jaffe³ lends support to the belief that operations may precipitate attacks of post-operative thrombosis. They have found several strong reasons for this opinion. It is apparent from this study that, emergencies excepted, operation should not be undertaken in patients over fifty years of age until they have been thoroughly investigated for

coronary disease, and that when this is present and operation is considered advisable in spite of it or even because of it, special care should be taken to minimize shock and dehydration and to avoid infection.

With the introduction of insulin in the treatment of diabetes, the arteriosclerotic complications of diabetes are today the chief cause of death in this disease. The high frequency of acute coronary thrombosis in diabetic patients has been pointed out by several authors. It is therefore wise for the clinician to warn surgeons contemplating operation on older diabetics as regards the possibility of precipitating an attack of coronary thrombosis.

ANGINAL SYNDROME

Angina pectoris is a symptom complex and not a disease. The etiology of this syndrome is varied, but anoxemia of the myocardium is probably the most frequent factor in its causation. The opinion is held that the anginal syndrome precedes coronary thrombosis in about half the cases.

Patients with angina stand operation well, yet the operative risk is considerably greater than it is in normal individuals. In selected cases the removal of a focus of infection, such as cholecystitis, often give marked relief of the anginal syndrome.

THE HYPERTENSIVE TYPE

In this type it is frequently difficult or impossible to separate arteriosclerosis from essential hypertension as a cause of heart disease, because they so often coexist. There comes a time in the history of every case of hypertension when one of three places of the vascular tree begins to fail—either the heart muscle fails, or there is rupture of a cerebral vessel or elsewhere, or gradually increasing sclerosis results in a failure of the renal function.

In general, hypertensive patients stand operation very well. If hypertension exists with a sound circulation and good kidney function it adds little to the operative risk, although we can never be sure of the condition of the cerebral vessels. An examination of the fundus of the eye is the only method of detecting the nature of the cerebral

arteries. However, the loss of blood during an operation is often a good safeguard.

The most important factor in hypertensive patients is to determine the condition of the myocardium by the response to effort, and I submit that the tests of everyday life are usually just as valuable if we use them.

CONGESTIVE HEART FAILURE

Hypertensive heart disease is the commonest cause of failure, especially in the middle-aged. A recent cardiac decompensation may occasionally be mistaken for a surgical condition of the abdomen, especially gall-bladder disease.²

Most writers hold the opinion that the presence of congestive heart failure greatly increases the operative risk. Hamilton⁴ advises that every operative procedure should be delayed at least three weeks after complete subsidence of the decompensation, however mild it may be. It is evident that patients with congestive failure should be given the benefit of satisfactory medical treatment before surgery is contemplated, except in emergencies. On the other hand, operations often give such relief that the heart not infrequently recovers from its decompensation.

Inasmuch as most hypertensive patients eventually die of heart failure and every case of essential hypertension has potential heart disease, most authors believe that the risk of precipitating heart failure through operation is slight, if there has been no past history of cardiac failure. The presence of hypertensive nephritis may prove a sufficiently additional burden to determine a fatal outcome.

THE SYPHILITIC TYPE

Syphilitic disease of the heart is almost exclusively confined to the aorta.

Syphilitic aortitis with or without regurgitation has a very high unexpected mortality rate as a result of surgical procedures. It is in the advanced type of aortitis where the patient is apt to die suddenly.

The widespread publicity given syphilis within recent years has fixed public attention on the importance of the early and effective treatment of this disease. As a result of this public education, syphilitic heart disease may

become a less important factor in the surgical mortality rate.

THYROID DISEASE

Only a small proportion of patients with hyperthyroidism show signs of cardiac disease. Every case of hyperthyroidism shows certain cardiovascular phenomena which are not due to definite pathology but due to the overactivity of the thyroid gland. The most important of these are sinus tachycardia and forceful action of the heart. However, the characteristic features of thyroid heart disease due to hyperthyroidism are cardiac enlargement and paroxysmal or permanent auricular fibrillation.

Although thyroidectomy is now generally accepted as the treatment of choice in hyperthyroidism, the vast amount of careful and painstaking investigation that is being carried on in the field of endocrinology at the present time leads us to believe that thyroid disease will become entirely a medical problem.

The surgical risk in thyroid disease is probably less than the usual symptoms make us fear. The mortality in such cases depends in a large measure on the skill of the surgeon, as well as the cooperation of the internist.

It is evident that the only satisfactory treatment of the cardiac complications of thyroid disease is to stop the intoxication at the earliest possible by a satisfactory period of rest, high caloric diet, adequate fluid intake, iodinization, and then surgery. Until this is accomplished, digitalis and similar drugs have no effect. The use of digitalis in the treatment of cardiac symptoms of thyrotoxicosis is very disappointing. Frequently after a thyroidectomy, the heart rate will have slowed and an auricular fibrillation of months' duration will have been converted into a normal sinus rhythm without the use of drug therapy directed toward the heart.

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MARIHUANA

"The use of marihuana is a 'sensual addiction' in the service of the hedonistic (devotion to pleasure) elements of the personality," Walter Bromberg, M. D., New York, reports in a psychiatric study of the drug, published in *The Journal of the American Medical Association* for July 1.

His paper, based on experience gathered over a period of six years in the Bellevue Hospital and the Psychiatric Clinic of the Court of General Sessions, New York County, emphasizes the many dangerous aspects of the drug and at the same time corrects some of the erroneous beliefs regarding it.

"The reported lack of increased tolerance and the absence of demonstrable withdrawal symptoms argue against the theory that marihuana is habit forming," Dr. Bromberg asserts. He believes that use of the drug is followed by a functional derangement of the brain or is part of a beginning mental upset; the personality factors and the emotional reactions of the victim are more important than the effects of the drug directly on the brain.

"Every case of marihuana intoxication presents a complex picture which must be studied in the light of the individual patient," he says. "The important problem of suicidal attempts following the use of marihuana has been indicated in the cases reported to represent the response to attacks of anxiety and panic reaction induced by the drug. Unquestionably marihuana is a dangerous drug from this point of view."

Marihuana, or hashish, is a contraband preparation of the hemp plant (*Cannabis sativa*) which contains the active principle cannabis. It is commonly used in cigarettes, smoking producing characteristic symptoms.

"The effects of smoking marihuana are emotional," the doctor says. "It induces a feeling of physical well being and mental acquiescence and less commonly anxiety and apprehension, and also feelings of unreality and aberration of the time sense. It induces feelings of bodily change, such as lengthening of the limbs and swelling of the head. It influences involuntary movement, causing restlessness and excitement in varying de-

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EDITORIAL

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W. EDWIN BIRD, M. D., Editor
Du Pont Building, Wilmington, Del.

JOHN H. MULLIN, M. D., Associate Editor
Medical Arts Bldg., Wilmington, Del.

M. A. TARUMIANZ, M. D., Associate Editor & Bus. Mgr.
Du Pont Building, Wilmington, Del.
Telephone, Wilmington, 4368

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WE KNEW IT LONG AGO

The regimentation of the American people—that began with the notorious NRA, that continued through the illogical AAA, that led to the political indicting of the AMA—is proceeding true to its predicted course, to the end that all the people will be goosestepping according to the tune of a government that has proceeded, stage by stage, from paternalism, to so-called liberalism, to semi-socialism, and now to—what next?

More than three years ago we predicted that the next assault would be upon the medical profession, to be followed by the legal profession. Prophet though we then were, we did not dream that the attack on the lawyers would come in less than twelve

months after the assault on the doctors, but here it is. Let the press dispatches, as appearing in the *Wilmington Journal-Every Evening* for July 10, 1939, tell the sordid story:

San Francisco, July 10 (AP)—The American Bar Association Convention opened today with delegates studying an assertion by U. S. Solicitor General Robert H. Jackson, that lawyers must arrange a cut-rate service for wage earners or risk government control of their profession.

"Our bar," Jackson declared, "cannot claim to be discharging its full duty to society by rendering service that is out of reach of an increasing proportion of our people."

The solicitor general spoke yesterday at a gathering of the junior bar conference, composed of lawyers under 35. The junior group's meeting was preliminary to the opening of the six-day convention program which has brought many of America's leading men to San Francisco.

Another main topic as the convention opened was an impending fight over the bill of rights committee of the bar association. President Frank J. Hogan, Washington, D. C., said he would resist any effort to curtail the functions of the committee, as threatened by Robert Carey, Newark, N. J., member of the House of Delegates.

Solicitor General Jackson, declaring the high cost of legal services might cause the government to intervene, said that "something like this has happened to the medical profession."

Jackson said that the very poor get legal service through public agencies, and that the well-to-do can hire good lawyers.

"But there are millions of people," he said, "who belong to neither the well-to-do nor the very poor. Their scale of earning will not let them pay so much for legal service as the modern lawyer charges."

"Their need is not a charity agency but a low cost legal service."

"I have grave doubts that society will continue to support idle lawyers (on the WPA) and at the same time go without their service once it wakes up to what it is doing."

Jackson declared the bar could "if its professional organization were strong enough and so willed, organize within the profession itself privately managed but self-sustaining, low cost, high volume legal services."

"In default of our attention," he said, "this problem will be likely to be forced upon the government."

MARIHUANA

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grees in different persons, and it produces mental confusion with possible visual illusions and hallucinations."

From his experience Dr. Bromberg concludes that there are two types of mental conditions which follow its use. The acute intoxication (marihuana psychosis) condition, characterized by sensory and motor changes, lasts from several hours to several days, often with anxiety or hysterical reactions, and transient panic states or depressions. It is induced by smoking from one to four cigarettes, with the reactions starting after an interval varying from one-half hour to five hours.

The other condition, toxic psychoses (mental disorders due to a poison), includes various disturbances of the senses with delusional and emotional reactions amounting to a psychosis and irregular functional psychoses which are initiated or colored by marihuana in their symptoms but continue in the form of the underlying psychoses. In toxic psychosis, other toxic agents, such as alcohol, as well as other drugs and infective or other internal elements, may be involved. The psychosis lasts from weeks to months. Often the mental picture crystallizes into a schizophrenia (cleavage of mental function) or a psychosis characterized by alternate periods of mania and depression. Either of these disorders may occur after several weeks or months.

"With psychopathic personalities, those with deep inferiorities," the author says, "the use of drugs is a method of supporting the ego. Marihuana does not always produce the

desirable effect. Apparently it is not strong enough to affect the problems which have involved the deeper layers of the personality."

In reference to the criminal aspects of the smoking of the drug, Dr. Bromberg says that in the South of this country (New Orleans), the incidence of marihuana addicts among the major criminals is admittedly high. Sporadic reports from elsewhere in the country of murders and assaults due to marihuana appear in the press frequently. It is difficult to evaluate these statements, because of their uneritical nature.

"As measured by the succession of arrests and convictions in the Court (the only method of estimation)," the author observes, "it can be said that drugs generally do not initiate criminal careers. Whether the first offenders charged with the use of marihuana go on to major crimes is a matter of speculation. The expectancy of major crimes following the use of cannabis in New York County is small, according to these experiences.

"The problem of habituation to cannabis is of grave importance. It should be remembered that marihuana has been used in conjunction with morphine, heroin or cocaine. The increase in cigaret consumption, if it occurs, is apparently related to how often the smoker wishes to experience the sensations produced."

BOOK REVIEWS

Organized Payments For Medical Services.
By the Bureau of Medical Economics, A. M. A. Paper. Pp. 185. Chicago: American Medical Association, 1939.

It would stretch the imagination of a social planner to devise any scheme for the organized payment of medical services that is not described in this publication of the Bureau of Medical Economics of the American Medical Association on "Organized Payments for Medical Services." Several hundred plans for medical care of the indigent involving governmental support and medical society management are explained. Social Security legislation has brought about changes in medical arrangements reaching into almost every locality in the United States and affecting health departments, medical so-

cieties, and state and local governments. Types of plans proposed by the Farm Security Administration to provide medical services to Administration clients in 127 counties and covering 100,000 low income families are described. Medical societies have organized postpayment and prepayment plans of medical care offering a wide selection of types. Some provide for a cash indemnity to be paid to the insured with which he can purchase his own medical service and others provide medical service directly.

Industries, unions, fraternal organizations, and all sorts of mutual societies provide medical benefits for their members by a variety of prepayment devices. Some 3,000,000 persons are covered by group hospitalization plans, which show a wide variety of relations with state and county medical societies. Commercial insurance companies, all of whom pay benefits in cash, are also entering this field on a large scale. It is estimated that approximately \$300,000,000 in cash is paid out annually by insurance companies to assist in paying medical bills.

The House of Delegates of the A. M. A. has endorsed cash indemnity prepayment plans, but has not sought to prohibit any of its component societies from cooperating with or organizing other types of prepayment for medical service, provided their character is not such as to render it impossible to give good medical service.

The number and variety of the plans for medical services—operating and proposed, postpayment and prepayment, service and cash, medical society and other organization sponsored—give proof of the efforts that are being made to supplement the private practice of medicine and indicate a desire to discover, by social experimentation, a solution of local medical problems.

Factual Data on Medical Economics. By the Bureau of Medical Economics, A. M. A. Paper. Pp. 77. Chicago: American Medical Association, 1939.

This brochure is an arsenal of absolutely, reliable data concerning physicians, hospitals, vital statistics, sickness insurance, etc. It is

replete with tables and graphs, and provide the answers to innumerable questions.

Population, Race and Eugenics. By Morris Siegel, M. D. Pp. 206. Cloth. Price, \$3.00. Hamilton, Ontario: Morris Siegel, 1939.

This is an interesting presentation of an interesting subject, written apparently for the layman. (Incidentally, Wassermann is spelled with two "n's"). A wealth of historical and statistical data is presented, together with a discussion that is quite orthodox. The book should be welcomed by the studious layman.

An Introduction to Sociology and Social Problems. By Deborah MacLurg Jensen, R. N., B. Sc. Lecturer in Nursing Education, Washington University. Pp. 341. Cloth. St. Louis: C. V. Mosby Company, 1939.

This textbook for nurses, by the wife of a physician, is one of the most readable discussions of this subject that we have seen. The style is agreeably terse; the arrangement excellent, and the faintly tinted paper is first aid for tired eyes. This is a book that ought to be in every nurses' training school.

A Textbook of Obstetrics. By Charles B. Reed, M. D., Associate Professor of Obstetrics, Northwestern University, and Bess J. Cooley, R. N., Instructor in Obstetrics, Wesley Memorial Hospital, Chicago. Pp. 476, with 209 illustrations. Cloth. St. Louis: C. V. Mosby Company, 1939.

This book is novel from the printer's viewpoint in that it is printed on tinted paper, with good-sized type, which lessens the fatigue on the eyes when reading.

The style is different from the usual textbook. The authors succeeded in writing a book which reads like fiction, and they make it particularly understandable to one who has never before studied or read this subject. Despite its easy style the facts are accurate. The text is well illustrated.

The arrangement of the book is a little bit different than usual, in that all the complications of pregnancy are put where they properly belong, under the chapter on 'Prenatal Care.'

The authors treat the chapters on physiology very carefully, explaining in conservative detail the functions of the hormones.

In the chapter on anesthesia and analgesia one finds the subject matter treated thoroughly, with many practical suggestions. Contained in the book is advice essential to hospital routine and management, which are important. At the end of this book, which is rather novel, is an epilogue; every student would do well to read this chapter.

This book should make a worthy addition to any nurses' training school, for which purpose it apparently was written.

Priests of Lucina—The Story of Obstetrics. By Palmer Findley, M. D., sometime Professor of Genecology, University of Nebraska. Pp. 421, with 38 illustrations. Cloth. Price, \$5.00. Boston: Little, Brown and Company, 1939.

The story of obstetrics from Hippocrates to John Whitridge Williams has been told for the first time in English by Dr. Findley. The book is divided into two parts—the first presenting short biographical sketches of the physicians whom the author believes have

contributed most largely to the development of an obstetric science; the second furnishing a brief history of special phases of obstetrics. This work should interest both physician and layman, for as Irving has said in his foreword: "Written in the biographical manner, it endows each name with a vitality which could have been accomplished in no other way. Chamberlen, Simpson and Holmes each becomes alive, not because he invented the forceps, or used chloroform in childbirth or led the battle against puerperal fever, but because of a vivid personality, set against the background of his time." The story of Semmelweis is told in such a graphic manner that the reader may close his eyes and in his mind picture his long struggle for cleanliness in obstetrics. In view of the statistical proof of the value of cleanliness at the Vienna Lying-in Hospital it is hard for us to realize that the world's leading obstetricians of eighty years ago would not listen to either Holmes or Semmelweis.

Dr. Findley's Priests of Lucina should have a good reception.

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